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Inspection
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Cooperative Screwworm Exclusion Program

**Environmental Analysis,
October 1998**

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I. Need for the Proposal

A. Introduction

The screwworm, *Cochliomyia hominivorax*, is a fly of the family Calliphoridae that is found in tropical and subtropical regions of North, Central, and South America. The screwworm is a serious pest of warm-blooded animals, causing injuries and death of livestock, domestic animals, and (sometimes) human beings. Screwworm adults are attracted to the open wounds of animals where they lay eggs that hatch into larvae (maggots). As the larvae feed on the flesh of an animal, the infested wound becomes enlarged and putrid, attracting more screwworm flies that lay more eggs in or near the wound. This disease condition is known as myiasis. If untreated, a severe case of myiasis may cause the death of the animal within ten days. Less severe cases may be characterized by weight loss and secondary bacterial infections.

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) has eradicated the screwworm fly from the United States and has participated in a number of successful cooperative screwworm eradication programs in Mexico and Central America. As a result of those cooperative efforts, Mexico was officially declared free of screwworms in 1991, Belize and Guatemala in 1994, El Salvador in 1995, and Honduras in 1996. There are eradication efforts currently underway in Nicaragua and Costa Rica. Screwworms are endemic to the Republic of Panama, where they cause losses to livestock, constitute a risk to human health, and serve as a source of infestation to eradicated countries to the north.

The severe risk to livestock and humans that would result from the entry into the United States of an animal or human infected with screwworm larvae makes it necessary for APHIS to plan an effective emergency response to ensure that veterinary or medical treatment is done in a timely manner and that any risk of spread of released fertile adult flies from the infested host is prevented.

B. Purpose and Need

Increases in recent travel to some Latin American countries and in the frequency of transport of potential screwworm hosts have resulted in elevated likelihood of screwworm reintroductions to the United States. The discovery of any infested person or animal returning to the United States from these countries requires that those persons/animals receive emergency

medical or veterinary treatment to remove any active larvae present in open wound tissues. The possible emergence of full grown screwworm fly larvae from the infested individual poses a great risk of fly dispersion to the surrounding community and this potential to spread constitutes a public health threat, an environmental threat, and an agricultural threat. Discovery of infested animals is often revealed by veterinary inspection upon arrival, but screwworm myiasis in a human may go undetected for several days after the person has returned to the United States. Treatment of the infested individual should begin as soon as the disease is discovered to prevent possible emergence of live screwworms from the open wound.

Delays in treatment increase the possibility that larvae could emerge and reproducing adult flies could escape to the surrounding areas. This potential route of pest risk was not considered important until a recent case of screwworm myiasis was diagnosed in a tourist who traveled to Brazil. Viable larvae were extracted from this tourist's wound and some full grown larvae had emerged in a local residence in Alabama. The opportunistic nature of the screwworm flies in these site-specific situations makes it critical that emergency action begin immediately to eliminate any pest risk.

In response to the elevated threat of infestation of screwworms to livestock and humans in the United States from these cases of myiasis, APHIS proposes to participate cooperatively with the State agricultural departments in localized actions designed to exclude and eradicate screwworms from places in the United States where myiasis is diagnosed in an infested person or animal returning from those Caribbean and Latin American countries where this fly species is established or endemic. The emergency nature of these actions to exclude screwworms from being reintroduced to the United States requires that all necessary planning documentation be prepared in advance to allow the required emergency actions to proceed in a timely manner. Each exclusion action will be adapted in response to the individual circumstances associated with the detection of persons or animals with myiasis. The nature of screwworm fly myiasis makes it clear that an infested passenger or animal could enter at any international airport, border crossing, or marine port. Therefore, actions could occur at any location in the country. However, the urgency of response to actual pest risk increases at those locations where the screwworm fly has historically been known to breed year-round, that is, especially locations in the southern United States where average winter temperatures are not cold enough to affect screwworm fly survival.

APHIS has responsibility for taking actions to exclude, eradicate and/or control agricultural pests such as screwworms. The statutory authority for

conducting this program in cooperation with the State agencies is contained in the Talmadge-Aiken Act (7 U.S.C. 450); and in 21 U.S.C. 111, 114, 123, and 134. APHIS' authority for regulatory action in this program is based upon 7 CFR Part 2.80, which authorizes the implementation of programs to exclude, control, and eradicate insect pests that serve as agents of animal disease.

This environmental assessment has been prepared to satisfy the provisions of the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4327 (NEPA)) and the Council on Environmental Quality's Regulations for Implementing the Procedural Provisions of NEPA.

II. Alternatives

The two alternatives considered for exclusion of screwworms from and eradication of screwworm at the sites of entry in the United States are: (1) a cooperative screwworm exclusion program (the preferred alternative), and (2) no action. The scope of alternatives is limited necessarily by the need for action; however, flexibility exists within the framework of the kinds of actions that are possible within the preferred alternative. The possible actions applied to each alternative are described in this chapter and the potential environmental impacts associated with these alternatives are presented in chapter III.

A. Cooperative Screwworm Exclusion Program (Preferred Alternative)

The proposed Cooperative Screwworm Exclusion Program would be characterized by a comprehensive program to detect screwworm flies in all life stages, treat infested individuals, and destroy wild screwworms through insecticide applications and, where necessary, release sterile screwworm flies. The program would involve the cooperation of APHIS with State and local agencies and departments to eliminate any potential pest risk when emergency program action is necessary. Veterinary inspection of domestic animals and livestock of foreign origin would be done to detect screwworm myiasis. The discomfort of any people who get infested with screwworms is likely to make them seek assistance from a medical doctor. The length of time that elapses before these individuals seek medical treatment will determine the potential for introduction and spread of screwworms into the United States. Earlier medical treatment (preferably immediately upon entry to the United States) would result in less chance of fly emergence from a festering wound. A thorough pathway study would be required to identify all

possible sites of fly emergence. The program would require insecticide treatment of all sites where there is a high risk of screwworm introduction.

Detection of screwworms involves surveillance of host animals and humans for infections, monitoring for flies using insect traps, and reporting of cases of infection by ranchers, veterinarians, and medical personnel. Most detections are expected to be reported through veterinary inspections or medical reporting. Trapping may be used if it is suspected that adult flies may have emerged at a given location. Swormlure-IV®, the lure used in the screwworm traps, releases a strong odor like decaying flesh of animals to attract the screwworm flies.

Program response to the reported entry of an infested person or animal must be made on a case-by-case basis. The immediate medical or veterinary treatment of the individual or animal is the initial response to prevent further tissue damage and to prevent the emergence from open wound tissue of mature larvae that could disperse. The needed amount of program action after this required treatment depends upon the circumstances related to the movement of the infested host and to the amount of development of the larval screwworms in their open wound tissues. These program decisions to take action will be case-specific for the infested host/s and site-specific to their location of entry and areas of movement within the United States prior to receiving medical or veterinary treatment.

When a case of screwworm myiasis is found several days after a person or animal has returned to the United States, APHIS will conduct an epidemiological pathway study to determine the possible locations in the United States where emergence of viable larvae from the wound could have occurred. This study is done by reviewing the locations where the person or animal has been since their entry into the United States. If the screwworm myiasis is detected at the time of arrival of the individual into the United States and treated immediately, then further actions may not be needed to eliminate the risk of screwworm reintroduction after treatment. If the infection is detected at an early stage when the screwworm larvae are only in the first instar (stage), then the risk of release of viable screwworms from the infested host is slight and further actions may also not be needed to eliminate the risk of screwworm reintroduction after treatment. If, however, there has been some larval development in the infested tissue and the infested individual has spent some time at various locations in the United States, then further agency action should be considered.

To eliminate the screwworm's threat to livestock and humans in the United States, APHIS must prevent introduction of screwworms at all locations

where the adult flies could emerge. After the infested host is treated, APHIS would determine where the individual stayed during their infested condition. The extended presence of the infested individual at home would make it necessary to treat the infested resident's dwelling inside and all properties within 200 meters of the infested resident's dwelling outside to prevent any potential for spread of adult flies. All potential treatments would be made with insecticides registered with the U.S. EPA for control of flies or mosquitoes. The treatments would be applied in a timely manner to ensure that there is no survival of adult screwworm flies and no movement of flies outside the treatment area. In addition, treatment of other locations where the infested individual(s) spent their time will be considered based upon potential pest risk. The applications of insecticides to the interior of buildings would most likely consist of pyrethroids or other pesticides with a short residual for control of flies. Outside applications of insecticide would be conducted the same as local mosquito control operations and repeated as necessary to eliminate pest risk from screwworms. In the absence of local pesticide registrations for mosquito control, insecticide applications would be conducted using registered products for general fly control outside.

The release of sterile screwworms, a technique used with great success and negligible environmental impact for the past 20 years, involves the mass rearing, sterilization, and release by aircraft of the sterilized screwworm flies. The flies are released in sufficient quantities to outnumber and outcompete wild screwworm flies in the mating process. After successive releases, the wild screwworm population decreases to zero. The use of this technique would be limited by the supply of sterile screwworms and the logistics of releasing them at the sites where flies from the infested individual may have been emerged. There are only a few facilities that produce sterile flies for use in eradication programs and the flies produced at these facilities are generally designated in advance for use in specific programs. It is expected that there would rarely be sterile screwworm flies available for use in these exclusion programs. Some locations could use both an approved application of insecticide to ensure lower population followed by mass release of sterile insects. The decrease in feral (wild) populations of screwworms occurs gradually when sterile flies are released and it would require an extended time for this method to be successful. It is anticipated that the release of sterile screwworms would not be convenient or cost-effective for most site-specific exclusion programs.

APHIS actions related to this alternative prevent entry and spread of the screwworm fly to the United States. The costs of this prevention are much less than would be the control costs in the absence of this effort. The potential

consequences of implementing this program to the health of humans and livestock are minimal, especially when compared to those from no action. Likewise, there are few effects on nontarget wildlife from implementation of this program and those effects are much less than would be expected if no action were taken to exclude screwworms. The potential environmental impacts of the preventive measures upon implementation are considerably less than those from the no action alternative.

B. No Action

The no action alternative would not involve APHIS in any program to eradicate or exclude screwworm flies. APHIS activities under the no action alternative would probably be limited to professional consultation and some coordination in support of activities to eradicate the flies. The responsibilities for the eradication or suppression of screwworm flies would be given to state and local governments with possible assistance from some public health organizations. Selection of the no action alternative would be expected to eventually result in the reintroduction of screwworms to the United States. This alternative would have considerable potential for adverse effects to public health, to the well-being of livestock, and to the health and survival of susceptible species of wildlife. The potential adverse impacts from the selection of this alternative would be much greater than from a cooperative screwworm exclusion program.

III. Environmental Consequences

A. Cooperative Screwworm Exclusion Program

The objective of the screwworm exclusion program is to prevent entry of screwworms and eradicate any introduced screwworm flies released into the United States from an infested person or animal. The proposed program involves (1) detection of screwworm flies in all life stages, (2) treatment of infested individuals, (3) insecticide applications to eliminate any feral flies and, if necessary, (4) the release of sterile screwworm flies. Each of these methods has some environmental impacts, but the adverse impacts from these actions are generally minimal and of short duration.

1. Detection

The program monitoring of screwworm fly populations and movement involves detection by insect traps, surveillance of host animals and humans for infections, and reporting of cases of infection by ranchers, veterinarians, and medical personnel. Most detections are expected to be reported through veterinary inspections or medical reporting. Trapping may be used if it is

suspected that adult flies have emerged at a given location. Swormlure-IV®, the lure used in the screwworm traps, releases a strong odor like decaying flesh of animals to attract the screwworm flies. Although traps may capture other arthropods, it is anticipated that screwworm flies will be the primary organism collected. Capture of other arthropods in any traps is not expected to adversely affect populations of any of those nontarget species. Surveillance of host animals and reporting systems pose no adverse effects on the environment.

2. Treatment

The immediate medical or veterinary treatment of the infested person or animal is the initial action to prevent further tissue damage and to prevent the emergence from the wounded tissue of mature larvae that could disperse. Adherence to proper disposal of wastes from the medical and veterinary procedures ensures that there are no environmental risks and eliminates the potential risks of spread from screwworms that could emerge from untreated wounds. This treatment and proper disposal are critical to eliminate the public health risks, animal health risks, and risks to nontarget wildlife associated with screwworm fly infestations.

In addition to basic veterinary treatment, application of a 5% dust formulation of coumaphos may be used to treat external wounds on domestic animals and livestock to control and/or prevent screwworm infestations. This formulation is registered with the U.S. Environmental Protection Agency (EPA) for this use. Program personnel will be trained in the proper application procedures and safety precautions for this larvicide. Applications of this formulation are effective against screwworm flies and are not repellant to the flies.

Coumaphos is a moderately toxic organophosphate insecticide. Proper application of this formulation is safe to the applicator and to the treated animal. Proper handling of the coumaphos formulation poses no risk to components of the environment other than the screwworm flies or other parasites that could infest external wounds. Although other insecticide formulations may effectively control screwworm flies, they may be more toxic to the infested host, be more irritating to the wound tissue, have repellant qualities to screwworm flies, or lack current EPA registration for this type of treatment. As part of the planned mitigation measures for the program, the program will also implement appropriate pesticide storage and disposal procedures for coumaphos.

3. Insecticide Applications

The rapid response required for screwworm emergency efforts makes it important that insecticide applications be made in a timely manner to all sites where there is high risk of emergence of screwworms from wounds of the infested individual prior to their medical or veterinary treatment for screwworms. This could include insecticide applications to treat the interior

of the infested resident's domicile and other buildings to eliminate any larvae or adult flies that emerged. The pesticide applications could also be made to all properties within 200 meters of the infested resident's dwelling outside to prevent any potential for emergence and spread of adult screwworm flies.

All potential treatments are made with insecticides registered with the U.S. EPA for control of flies or mosquitoes. The treatments are applied by certified Pesticide Applicators in compliance with the pesticide labels. The applications of insecticides to the interior of buildings would most likely consist of pyrethroids or other pesticides with a short residual for control of flies. Outside applications of insecticide would be conducted in the same manner as local mosquito control operations and would be repeated as necessary to eliminate pest risk from screwworms. In the absence of local pesticide registrations for mosquito control, insecticide applications would be conducted using registered products for general fly control outside.

Adherence to the pesticide labels, reentry periods, and APHIS safety procedures for pesticide applications ensures that no adverse effects to applicators or residents returning to their homes after interior pesticide applications are completed. The human health and environmental risks associated with outdoor insecticide applications to control screwworm flies are comparable to those associated with other public health insecticide applications such as mosquito control. There may be a few individuals who are hypersensitive to the insecticides being used and those individuals should avoid the treatment area during the insecticide applications. The application of these insecticides is known to lower populations of susceptible invertebrates, but those effects are only temporary. Other non-target species are generally not affected by these insecticide applications. The insecticides used in these applications are not persistent in the environment and there would be no detectable residues in the environment within a few days of application.

4. Sterile Fly Technique

The sterile release program has minimal impact on the environment except the target insect. The irradiated insects are sterile, but they are not radioactive. These sterilized insects pose no hazard to the environment. Sterile insect technique has been determined to be safe for use in endangered and threatened species habitats. The sterile flies mate with feral (wild) screwworm flies and some may serve as food for natural fly predators and parasites. Although the release of sterile screwworm flies is effective, the availability of those insects is limited for emergency programs with very short notice. The use of sterile flies serves as a backup if detection traps capture feral flies, which indicates that the insecticide treatment was not effective at totally eliminating the adult screwworm flies that emerged from the infested individuals. Aircraft are generally used to release sterile flies, but ground releases may be applicable

under certain conditions. Pilots follow specific procedures to ensure safe, accurate, and timely releases of viable sterile flies at control sites. Adherence to these procedures decreases the potential for accidents and ineffective releases.

The rearing facilities for production of sterile insects are subject to stringent safety guidelines. Treatment and disposition of process water and waste water are done in compliance with effluent and U.S. Drinking water standards. Irradiation equipment is checked on a regular basis by the Nuclear Regulatory Commission and no problems associated with its use have been known to occur. The equipment releases radiation to the flies, but the flies do not store any radioactivity from their exposure. Equipment design eliminates the risk of worker exposure to radiation. The safety guidelines have been shown to effectively protect workers at sterile insect facilities.

5. Other Issues

The other issues related to the screwworm exclusion program include environmental justice and endangered species. Both of these issues is associated with specific environmental compliance requirements. Adherence to the program procedures, the Environmental Justice executive order, and the provisions agreed upon through interagency consultations prevent these issues from posing any substantial environmental risks.

a. Environmental Justice

Consistent with Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” APHIS considered the potential for disproportionately high and adverse human health or environmental effects on any minority populations and low-income populations. Those individuals who have the financial resources to travel to areas where the screwworm flies are endemic are expected to be predominantly middle or upper income level. Those travelers who get infested with screwworms are not expected to be at increased likelihood of residence or frequent visits to low-income populations more often than other locations. The import of animals or other livestock from countries where screwworms are established is an activity that is not specific to any subgroup of the population. Cooperative screwworm fly exclusion programs could occur at any location where an infested person or animal enters the country. Therefore, no disproportionate effects on such populations are anticipated as a consequence of implementing the preferred action.

b. Endangered and Threatened Species

The Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. 1531 *et seq.*) requires all Federal departments and agencies to consult with the U.S. Department of the Interior's Fish and Wildlife Service (FWS) and/or the U.S. Department of Commerce's National Marine Fisheries Service (NMFS) to ensure that any action that they authorize, fund, or carry out is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of its critical habitat (16 U.S.C. 1536(a)(2)). Most agency actions related to cooperative screwworm exclusion efforts are expected to occur in highly disturbed areas that would not be suitable habitats for endangered and threatened species. The use of sterile insect technique has been determined to be compatible for use in habitats of endangered and threatened species and could be applied effectively at some locations if necessary. APHIS will consult with FWS and/or NMFS regarding endangered and threatened species for each individual exclusion effort and will comply with all protection measures stipulated in that consultation and mutually agreed on with FWS and/or NMFS.

B. No Action

The no action alternative would not involve APHIS in any program to eradicate or exclude screwworm flies. The responsibilities for the eradication or suppression of screwworm flies would be given to state and local governments. Although state and local governments might successfully eradicate and exclude screwworms under certain circumstances, their access to useful resources on an emergency basis is more limited than APHIS. For example, the sterile insect technique used against screwworm flies is strictly a Federal or International effort that would not be directly available to State or local governments. Selection of the no action alternative would be expected to eventually result in the reintroduction of screwworms to the United States and eventually eradicated areas in Mexico and central America. The rate of dispersion from the site of introduction depends upon location and meteorological conditions at that time, but dispersion could eventually include the historic limits in North America. The screwworm fly was historically established in the southern United States and dispersed northward as far as the Canadian border annually. The damage to cattle production each year was immense and adverse effects to other livestock, human health, and wildlife from screwworm myiasis were considerable. Inaction or inadequate action would have considerable potential for adverse effects to public health, to the well-being of livestock, and to the health and survival of susceptible species of wildlife. The potential adverse impacts from the selection of this alternative could be unacceptable and would be much greater than from a cooperative screwworm exclusion program.

IV. Listing of Agencies and Persons Consulted

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
International Programs
4700 River Road, Unit 67
Riverdale, MD 20737-1233

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Policy and Program Development
Environmental Analysis and Documentation
4700 River Road, Unit 149
Riverdale, MD 20737-1238

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
4700 River Road, Unit
Riverdale, MD 20737-12

**Finding of No Significant Impact
for
Cooperative Screwworm Exclusion Program,
Environmental Analysis, October 1998**

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), has prepared an environmental assessment (EA) that analyzes alternatives for exclusion of the screwworm, *Cochliomyia hominivorax*, from the United States. The screwworm is a serious pest of warm-blooded animals, causing injuries and death of livestock, domestic animals, and (sometimes) human beings. The EA, incorporated by reference in this document, is available from:

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
4700 River Road, Unit 41
Riverdale, MD 20737-1231

The EA is available for public inspection at USDA, Room 1141, South Building, 14th Street and Independence Avenue, SW., Washington, DC, between 8 a.m. and 4:30 p.m., Monday through Friday, except holidays. Persons wishing to inspect the EA are requested to call ahead on 202-690-2817 to facilitate entry into the reading room.

The EA for this program analyzed alternatives of (1) a cooperative screwworm exclusion program (the preferred alternative), and (2) no action. Both of these alternatives were determined to have potential environmental consequences. APHIS selected the cooperative screwworm exclusion program alternative because of its ability to eliminate destructive screwworm populations with a minimum of potential environmental consequences. No adverse impacts are foreseen to human health for the preferred alternative. Minimal impacts are expected to the physical environment and nontarget species. Protection measures will be applied as needed to prevent potential adverse effects to endangered and threatened species.

I find that implementation of the proposed program will not significantly impact the quality of the human environment. I have considered and based my finding of no significant impact on the risk assessment prepared for the EA and on my review of the program's operational characteristics. In addition, I find that the environmental process undertaken for this program is entirely consistent with the principles of "environmental justice," as expressed in Executive Order No. 12898. Lastly, because I have not found evidence of significant environmental impact associated with this proposed program, I further find that no additional environmental documentation need be prepared and that the program may proceed.

/s/
Dr. Thomas Walton
Acting Deputy Administrator
Veterinary Services

January 5, 1999
Date